

What is Claimed is:

1. A method of producing a surface with enhanced cell-adhesive properties, comprising
 - a) treating a pre-formed surface to expose at least one intermediate reactive group on said pre-formed surface;
 - b) reacting said at least one intermediate reactive group to form a non-mechanical self-assembled monolayer comprising at least one reactive group; and
 - c) coupling at least one cell-adhesive molecule to said at least one reactive group to produce a surface with enhanced cell-adhesive properties.
2. The method of claim 1, wherein said at least one reactive group is present on said non-mechanical self-assembled monolayer immediately after said reacting said at least one intermediate reactive group.
3. The method of claim 1, wherein said at least one reactive group is not present on said non-mechanical self-assembled monolayer immediately after said reacting said at least one intermediate reactive group, and wherein a terminal group on said non-mechanical self-assembled monolayer is converted to said reactive group.
4. The method of claim 1, wherein said intermediate reactive group is a hydroxyl group.
5. The method of claim 1, wherein said pre-formed surface comprises polymer matrix.
6. The method of claim 5, wherein said polymer matrix comprises silicone.
7. The method of claim 6 wherein said silicone is polydimethyl siloxane (PDMS).

8. The method of claim 1, wherein said pre-formed surface comprises at least one oxygen-sensing compound.
9. The method of claim 8, wherein said oxygen-sensing compound is luminescent.
10. The method of claim 1, wherein said at least one reactive group comprises a reactive group selected from the group consisting of a carboxyl group, a hydroxyl group, an amide, an amino, an acyl group, an ester, an epoxy, a silane, a silanol, an aldehyde, and a sulfhydryl group.
11. The method of claim 1, wherein said reacting said at least one intermediate reactive comprises using a reactive solution.
12. The method of claim 11, wherein said reactive solution comprises a silane.
13. The method of claim 12, wherein said silane is trichlorosilane.
14. The method of claim 1, wherein said at least one cell-adhesive molecule is selected from the group consisting of a protein, a protein fragment, a polypeptide, an oligopeptide, an amino acid, a proteoglycan, a glycoprotein, a lipoprotein, a carbohydrate, a disaccharide, a polysaccharide, a nucleic acid, an oligonucleotide, a polynucleotide, a synthetic polymer, a natural polymer and combinations thereof.
15. The method of claim 14, wherein said at least one cell-adhesive molecule is selected from the group consisting of an extracellular matrix molecule, a growth factor and an antibody.
16. The method of claim 1, wherein said coupling comprises a carbodiimide.

17. The method of claim 16, wherein said carbodiimide is selected from the group consisting of ethyldimethylaminopropyl-carbodiimide, 1-cyclohexyl-3-(2-morpholinoethyl) carbodiimide and dicyclohexyl carbodiimide.
18. The method of claim 16, wherein said coupling further comprises a stabilizing agent.
19. The method of claim 18, wherein said stabilizing agent is selected from the group consisting of N-hydroxysulfosuccinimide (sulfo-NHS), hydroxysulfosuccinimide and hydroxybenzotriazolohydrate.
20. A device comprising a surface, said surface comprising
 - a) a polymeric matrix;
 - b) at least one oxygen-sensing compound; and
 - c) at least one cell-adhesive molecule coupled to a non-mechanical self-assembled monolayer via at least one reactive group, said non-mechanical self-assembled monolayer comprising said reactive group.